

AD-A059 959

MISSOURI UNIV-ST LOUIS DEPT OF PHYSICS
POTENTIAL LASER ACTION IN. HE-METAL VAPOR MIXTURES.(U)
SEP 78 J J LEVENTHAL

F/G 20/5

UNCLASSIFIED

2

N00014-76-C-0760

NL

| OF |
ADA
059959



END

DATE
FILMED

12-78

DOC

DDC FILE COPY
ADA059959

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

12

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER 14-25	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Potential Laser Action in He-Metal Vapor Mixtures,		5. TYPE OF REPORT & PERIOD COVERED Research Summary
7. AUTHOR(s) 16 Jacob J. Leventhal, Professor of Physics		8. CONTRACT OR GRANT NUMBER(s) 15 N00014-76-C-0760
9. PERFORMING ORGANIZATION NAME AND ADDRESS University of Missouri-St. Louis 410 890 8001 Natural Bridge Dept. of Physics St. Louis, Missouri 63121		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Office of Naval Research Arlington, Virginia		12. REPORT DATE 1127 September 27, 1978
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) LEVEL		13. NUMBER OF PAGES 4
15. SECURITY CLASS. (of this report) unclassified		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE UNC
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited. 123p.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report) DDC RECEIVED OCT 17 1978 F		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Excited State Production Laser Population Inversion		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Cross sections for excited state production in ion-molecule collisions have been measured by observing radiation resulting from decay of the excited species. Recent work involving collisions of He ⁺ or He ²⁺ with Mg and Zn are discussed.		

78 10 02 013

DD FORM 1 JAN 73 1473

EDITION OF 1 NOV 68 IS OBSOLETE
S/N 0102-LF-014-6601

Unclassified

He2(+)

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

Research Summary: ONR Contract No. N00014-76-C-0760

"Potential Laser Action in He-Metal Vapor Mixtures"

Principal Investigator: J. J. Leventhal
Professor of Physics
Department of Physics ✓
University of Missouri-St. Louis
St. Louis, Missouri 63121

1. Contract Description: Experimental studies of energy partitioning among internal states of products of atomic and molecular collisions. Such collision processes can selectively populate excited states, thus producing the population inversion necessary to achieve laser action.
2. Scientific Problem: The most important aspects of this work are to determine the fundamental rules that govern internal energy level selection in molecular collisions. Using the experimental technique developed at UMSL for the study of such processes, specific collision systems can be tested for promise as lasers.
3. Scientific and Technical Approach: The experiments are performed by combining molecular beam techniques with those of emission spectroscopy. A low energy mass selected ion beam is intersected by a thermal energy atomic or molecular beam, and the luminescence from radiative decay of excited species formed in the collision process detected by single photon counting. By scanning the wavelength a collision-produced emission spectrum is assembled. This spectrum directly leads to information on the internal energy states of products of the interaction.

78 10 02 013

